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On Standardization--

Standardization and inspection of farm products trace from the desire and need of producers, dealers, and consumers for a uniform "yardstick" with which to measure important variations in quality. The producer is interested in getting the price to which the quality of his product and the condition of the market entitle him. The processor and distributor need a quality gauge to facilitate buying and selling, particularly at long distances. The consumer wants assurance that he is obtaining a product of a quality in line with the price paid.

With the marketing of farm products now largely on a national basis, local or State standards and local or exclusively State inspection agencies cannot provide the degree of uniformity needed for transactions in interstate and foreign commerce. Therefore, if uniform standards are to be established, they must be developed and maintained by a recognized agency in position to consider the problem from a national point of view. An agency of the Federal Government, operating in close cooperation with State agencies and other interested groups, can best perform these services.

--C. W. Kitchen

Chief, Agricultural Marketing Service
1940 Yearbook of Agriculture

ARMOR-PLATED MILK

By John L. Wilson

In turning to mechanization, modern war machines have been a step behind the canned milk industry, which, for three quarters of a century, has incorporated into its product many of the same principles that have contributed to the success of the armored tank. Just as the steel outer shell of the Army's modern charger protects the men inside from enemy bullets, so does the lighter but adequate metal covering furnished by the tin can guard evaporated and condensed milk from bacterial sniping.

The analogy can even be carried a little farther. The tank represents a wealth of firing power in a vehicle that can be readily mobilized the rich food elements of cow's milk that against enemy forces. Likewise, the can of milk provides a concentration of can be easily and quickly moved up in support of a line threatened by malnutrition or rushed forward to rout man's arch-enemy, hunger. The production of tanks increases rapidly when war comes; and so does our output of canned milk, primarily because it takes up less space than fresh milk and because it is relatively nonperishable.

It was our own Civil War, coming at a time when the condensed milk industry was in its infancy, that first brought the desirable qualities of the product to public attention. Likewise, during the World War, canned milk production increased sharply, domestic output more than doubling between 1914 and 1919. Today, with armed conflicts raging on European fronts, condensed and evaporated milks are again feeling the impetus of war. During 1940, canned milk factories put on an added burst of speed and total production for the year exceeded previous high records by some 15 percent.

Exports Turn Upward

Not only has production soared, but exports have again turned upward as foreign nations stock their larders from the output of United States factories. When Germany started its drive in early 1940, it swallowed up two countries--the Netherlands and Denmark--that ranked first and second, respectively, in canned milk exports. Further developments of the war have caused Switzerland, another ranking exporter, to divert most of her surplus production to the German market.

And that's when Uncle Sam's supplies began to fill the gap. About the middle of last year, American exports of condensed and evaporated milk rose sharply, reaching a monthly total of about 56 million pounds in August. For the calendar year of 1940, exports from the United States totaled about 146 million pounds, or more than 4 times the average of the 5-year period preceding the outbreak of the war. Nearly half of these exports went to the United Kingdom, which, although the world's leading importer, took less than a million pounds from this country in 1939.

Although war directs much attention to canned milk, the production of condensed and evaporated milk should not be regarded as a war-time industry. In fact, much of its progress has come in times of peace. From 1920 to 1938 the domestic consumption of canned milk increased more than two and a half times. And, too, the scientific discoveries that paved the way for the industry have come when the Nation was at peace. Perhaps a glance at the history of canned milk will furnish a better background against which to appraise its growing usefulness.

Industry Founded on 19th Century Research

Milk has long been recognized as man's most nearly perfect food. In fluid form, however, its usefulness has been limited by its bulk and perishability. Canned milk products are an outgrowth of scientific research started more than a century ago to overcome these handicaps while still retaining a product with the many dietary properties of milk.

Commercial success was not realized until after Gail Borden, in 1856, patented a process for reducing the water content of milk in the rarified atmosphere of a vacuum pan. In this apparatus, atmospheric pressure on the milk is reduced by the removal of air so that the water boils off at a low temperature. If it were practical to condense milk at an altitude about 3 times as far above sea level as the tip of Pikes Peak, no vacuum pan would be needed, for there the pressure would not be far from the 3 pounds per square inch commonly maintained. The removal of the water from milk "in vacuo" at a low temperature--about 140 degrees F.--causes a minimum of change in the solid constituents of milk, and provides speed and economy in the condensing operation.

A second important milestone was reached about 3 decades later when Meyenberg, in 1884, patented a process for sterilizing milk with compressed steam. This discovery was important, because to maintain canned milk in a condition fit for human consumption, it is necessary to prevent the growth of bacteria and other minute organisms within the can. Meyenberg's discovery provided a way to prevent such sabotage without the addition of any substances foreign to milk. Though techniques have changed and machinery has undergone a vast improvement since the discoveries by Borden and Meyenberg, the two processes still constitute the foundation for the canned milk industry of today.

Canned milk appears on the market chiefly in two forms--condensed and evaporated. Most people are inclined to think of these terms synonymously since both represent cows' milk from which a large proportion of the water has been removed. However, there are distinct differences in the two products arising from the method of preservation employed. In the preparation of condensed milk, sugar is added in such a heavy concentration--about 40 percent of the finished product--that the growth of any organisms that remain in the milk is practically inhibited. Evaporated milk on the other hand is preserved by heating the sealed cans with compressed steam to such a high temperature--about 240° F. for 15

minutes--that any bacteria in the can are destroyed. The sugar employed in the preservation of condensed milk makes it the sweeter and thicker of the two products. Thus, it might be said that canned condensed milk resembles evaporated milk somewhat like tomato preserves resemble canned tomatoes. Evaporated milk, which contains no added sugar, has a much wider range of usefulness and is considerably lower in price. Over a period of two decades evaporated milk has gradually replaced condensed in the canned milk field. In 1940 evaporated milk represented about 97 percent of the combined output of the two.

Canned Milk Competes With Fresh Milk

A large part of the evaporated milk now sold appears on the retail counter in 14½-ounce cans. In 1931 the industry selected this size can as one that would contain sufficient milk solids to meet a former Federal standard for a quart of fresh milk. Although this container for evaporated milk gives the consumer 12 to 15 percent less solids than the quart of fresh milk usually sold, the difference may not loom large in the minds of many purchasers. Thus the can of milk on the grocer's shelf matches strides with the quart bottle of fresh milk in a race to determine which one will champion the consuming public in its battle against undernourishment. And both have their backers among the more than 100 million people in families that have no milk cow available for supplying them directly.

Although off to a late start in the race, canned milk has been gaining steadily in recent years. In 1921 the canned milk consumed in the United States represented about 2.1 billion pounds of milk equivalent. This totaled about 9 percent of the milk purchased by consumers in liquid form. By 1939 the consumption of canned milk represented 4.8 billion pounds of milk equivalent, or more than 13 percent of the total purchases of fresh and canned combined.

While canned milk is still far behind in the race for consumer preference, its rapid progress has caused growing apprehension in the fluid milk industry. And this industry may have cause for worry when comparative prices of fresh and canned milk are placed under the microscope. For example, in 1921 a quart of fresh milk at 14.6 cents cost 2 cents more than 14½ ounces of evaporated milk. In 1940 a quart of fresh milk delivered at 12.8 cents cost 5.8 cents more than a can of evaporated milk. No wonder homemakers with years of depression still fresh in their memories are inclined to examine the merits of canned milk very closely.

As far as nutritional value is concerned, the choice between evaporated and fresh milk appears to be largely a toss-up. The Department of Agriculture's dieticians state, in writing about good nutrition: "Milk is a cheap and important source of protein, calcium, vitamin A value, vitamin B₁, and riboflavin. The forms in which it is taken--whether as cheese, or as fluid, evaporated, or dried milk--

are largely matters of taste and relative cost." Of these five outstanding contributions of milk in the diet only one is appreciably lower in canned milk than in the fresh product from which it was made. Vitamin B₁ is reduced about 25 percent by the canning process and in storage may undergo some further destruction. In exchange for its lack of equality in water soluble vitamins, evaporated milk usually contains more vitamin D than the fresh milk ordinarily sold. Leading advertised brands of evaporated milk contain vitamin D added by the irradiation process and some of the unadvertised brands have vitamin D added by other processes. In the fresh milk field, fortification with the vitamin is usually reflected by an addition of 1 cent per quart in the retail price, while in evaporated milk added vitamin D costs, at most, only half a cent extra per can.

Canned Milk Has Its Problems

Despite an even footing with fluid milk in the nutritional field, evaporated milk carries an extra burden that so far has slowed it down in the race for consumer preference. Present processes of manufacture impart to the canned product a caramelized taste and a tendency to leave a sticky feeling in the consumer's mouth. The caramelized taste comes from the high temperatures which milk undergoes in sterilization while the stickiness is a result of the homogenization process that prevents fat separation in the canned product. Because these characteristics do not appeal to most consumers, first attraction to evaporated milk is usually brought about by factors other than its palatability. When economic necessity dictates the use of evaporated milk for a considerable period, however, many consumers may come to like its flavor as well as that of fresh milk. Sometimes even distinct preferences for evaporated milk are expressed. For example, complaints against the milk at a Blue Ridge Mountain camp were reputedly traced to a couple of Brooklyn boys who, having used evaporated milk, thought the fresh milk provided was definitely inferior to their previous fare.

The uses of canned milk in the household, however, seem to indicate that its flavor is not accepted on a par with fresh milk for drinking purposes. This was shown by Dr. Pierce of Pennsylvania State College who made a special study of the milk-consuming habits of about a thousand Johnstown, Pa., families. On a milk equivalent basis, these families used about half as much evaporated milk as they did fresh milk. However, seven-eighths of the evaporated milk used was for cooking purposes or in such flavored beverages as coffee, cocoa, and tea. For these particular uses any caramel taste of the milk would usually be masked by other more pronounced flavors, and canned milk accounted for about two-thirds of the milk so used. But for drinking, where the caramel flavor would tend to show up most sharply, fresh milk led evaporated in the ratio of 19 to 1.

This survey leaves the impression that canned milk, although winning favor from an economic standpoint, has not yet fully satisfied the palates of milk drinkers. Perhaps the number of babies now being raised

on evaporated milk will, in years to come, tend to alter this preference. Furthermore, the quality of canned milk has undergone a vast improvement in the wake of scientific progress and further improvement seems sure to come. Some men in the industry predict a flavor not appreciably different from that of fresh milk. Others are less optimistic and feel that the gap will be narrowed but never entirely closed. Only time will bring the final answer to this production problem. And in production there is another story.

Production Centers In the East North Central States

Although condensed milk was first produced in Litchfield County, Conn., major operations soon shifted to Dutchess County, N. Y., and a little later plants were built in Illinois. Evaporated milk in hermetically sealed cans was first produced commercially in 1885 by the Helvetia Milk Company at Highland, Ill. While early records do not differentiate between evaporated and condensed milks as we know them now, Census data at the end of the 19th century showed New York and Illinois leading in the output of condensery products. In 1899 these two States accounted for about three-fourths of the United States production.

The rapid development of condenseries in the Midwest came during the 'teen decade when the industry was feeling the spur of the World War. By 1918 Wisconsin had reached top rank ahead of New York, and since then has led all States in production of canned milk. In the past 20 years the importance of the industry in the Northeast has declined with the expansion of market milk outlets, but elsewhere production of canned milk has increased steadily. In 1939 Wisconsin produced about a third of the national output and a majority of the other leading States were centered close by. The East North Central group together with Kentucky and Missouri form a block of 7 States each of which ranked among the first 10 in production of canned milk. The combined pack in this group of States represented more than three-fifths of the national output in 1939. Other leading States included California, New York, and Washington.

For the past 15 years or so "Dixie" has been extending its famed southern hospitality to the canned milk industry and with remarkable success. As late as 1925, records of the Agricultural Marketing Service show no appreciable quantities of canned milk manufactured in the South, outside of Maryland. In 1939, however, four States in this territory--Kentucky, Tennessee, Mississippi, and Texas--produced more than 30 million pounds each. And in that year the South as a whole produced about 11 percent of the Nation's total.

The influx of condenseries into the South appears to have followed the development of modern transportation facilities. A score of years ago the assembly of a volume of milk sufficient to operate a condensery would have been a Herculean task in much of this area. The development

of good roads and truck transportation have done much to broaden the condensery's supply base and to increase the volume of milk available. Condenseries in the South also enjoy certain advantages over those in other parts of the country. They have first chance at southern market outlets because of lower transportation costs. And in the past decade, the potential southern market has been expanding if Census population figures may be regarded as an index of prospective milk consumers. The rate of population gain in the South between 1930 and 1940 was about two-thirds greater than in the remainder of the country. Southern condenseries also have to pay somewhat less for the milk used for canning. Prices for 3.5 percent milk in Southern States in 1939 average lower than in any other major area and about a dime per hundred pounds less than in the East North Central area where the bulk of the Nation's canned milk was packed.

Although prices paid by condenseries to southern producers tend to be low in relation to those in other sections of the country, they usually represent better returns than are obtained from milk or butterfat used for other manufactured dairy products. The wild onion, so widely distributed in southern pastures, gives milk a tenacious and very undesirable flavor at certain times of the year. The evaporation process that milk undergoes in the condensery removes the onion flavor, which for butter or cheese production can be eliminated only by special processes. This fact gives condenseries some advantage in competing for any additional supplies of milk available from diversified agricultural practices in the South.

Southern condensery operators also have some other problems not so noticeable in many parts of the country. In the first place, milking herds are usually small with relatively few of sufficient size to support commercial dairy plants. Occasionally individual daily deliveries of milk may be no larger than a bucket of milk carried over the hill to the condensery by the farmer himself. Frequently, five to ten times as many producers deliver milk to a condensery in the South as to a factory of similar size in areas such as Wisconsin. So many small deliveries not only involve more work for the plant operator but also tend to be associated with milk of poorer quality. To offset lack of cooling facilities, twice-a-day delivery has been successfully adopted by some condenseries with a resulting improvement in quality of the milk but at somewhat higher assembly costs. Another problem arising from the high test of milk from the many Jersey cows in the South appears to have been minimized by development of markets for any excess butterfat left after standardizing the milk for canning.

Agreement Guarantees Farmers A Minimum Price

The evaporated milk industry has been operating since 1933 under licenses issued by the Secretary of Agriculture in connection with a marketing agreement. The present marketing agreement, as amended in 1935, provides for a minimum price to be paid producers for milk delivered

to evaporated milk plants, together with other features including a standard of fair trade practices among manufacturers, the filing of wholesale selling prices of evaporated milk, and a system for checking weights and tests.

The method of determining the minimum or "code" prices of milk may sound a good deal like a cross-word puzzle to the uninitiated. For example the minimum price per 100 pounds of milk in the important East North Central area is obtained by successively multiplying the monthly average wholesale price of 92 score butter at Chicago by 6, adding 2.4 times the monthly price of "Twins" on the Wisconsin Cheese Exchange, dividing by 7, adding 30 percent, and multiplying by the butterfat content of the milk. The formula, however, is scientifically derived and recognizes the close bond between prices of the several major dairy products. The milk price is determined on the basis of its butterfat content but valuation of the butterfat is based on wholesale prices of manufactured dairy products. Various allowances in setting the butter fat value provide the farmer a return for the other solids in milk.

Minimum prices in the five other geographic areas outlined under the agreement are similarly determined, but vary according to base-product used, wholesale market specified, or differentials allowed. In all States east of the Rocky Mountains any butterfat over 4 percent in the milk must be figured in at a "marked down" value for this excess fat is usually resold in some form other than evaporated milk. The minimum price for milk delivered to the plant but used for purposes other than production of evaporated milk is usually figured somewhat differently.

In actual practice, the producer usually receives returns for his milk somewhat above the minimum price for the area as calculated from the condensery code formula. Records over a period of years, as compiled by the Agricultural Marketing Service, show the spread tends to be greatest in the western part of the country and often varies with supply conditions. The willingness of factory operators to pay prices above the minimum stipulated by the code indicates that there is competition for the milk supply, and in turn calls attention to the manufacturing end of the business.

Manufacture Centralized but Margins Small

Canned milk manufacturers stand apart from firms making other types of factory dairy products in that control is centered largely in the hands of a few companies. The industry has grown to its present proportions through the erection of additional plants by established firms rather than as the result of factories started under new ownership. This characteristic of the industry appears to have developed from the large capital investments necessary for equipment, from the relatively high cost of processing canned milk compared with other dairy products, and because a large part of the product is merchandised under a few nationally known brands.

More than three-fifths of the canned milk output today is under control of less than half a dozen companies. In spite of the centered control of the industry, however, cries of "monopoly" are much less evident than in some other branches of the dairy industry. In fact, Froker, Colebank, and Hoffman, in discussing large-scale organization of the dairy industry make the statement: "The canned milk industry appears to offer an illustration of the fact that large-scale organization and vertical integration sometimes make for greater marketing efficiency and reduced marketing spreads."

Making a direct comparison of evaporated and fresh milk handling costs, Leland Spencer of Cornell University, brings out some interesting facts. His figures for May to October 1939, show that a quart of milk equivalent in canned form, although involving a 1.1 percent greater processing cost than a quart of fresh grade B, actually sold in New York City stores for 2.7 cents less. Savings in cost of selling, delivery, and shopkeepers' margins totaled 2.3 cents per quart in favor of evaporated milk. The cost of the raw milk used for canning, purchased on unrestricted midwestern markets at 1.6 cents less per quart than the milk for fresh distribution bought in the New York milkshed, also accounted for part of the difference in retail price.

Over a period of years the unit cost of manufacture and distribution in the canned milk industry appears to have declined materially. In the first 9 months of 1940 the margin between retail prices of evaporated milk and the prices paid by condenseries for the raw milk was the smallest of a 20-year record, and less than half the margin existing in 1921. All of this indicates that the canned milk industry hasn't been doing so badly for either the farmer or the consumer.

The place of canned milk in the dairy industry as a whole has not, as yet, reached large proportions. In 1939 the factory output of canned milk in the United States absorbed about 4.85 billion pounds of milk, or about 6 percent of the Nation's commercial supply. This was only about one-seventh as much as utilized for butter and two-thirds as much as used in cheese. However, the rate at which the production of canned milk has been gaining, the stimulating influence of the war, and prospects for a wider domestic market with future improvements in quality, all suggest a much more important role for armor-plated milk in the world of tomorrow.

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Lady's Pet of Betts Homestead 542376, a purebred Guernsey cow owned by L. B. Wescott, Clinton, N. J., recently broke the record for milk production in her class. "Pet"--whose record is 12,618.5 pounds of milk and 645.6 pounds of butterfat for 305 days--now reigns as queen of Class GGG, which includes all registered two-year-old Guernseys milking for 305 days and carrying a calf. The average Guernsey production in the same class is 7,091.9 pounds of milk.

FARMER IN '40 GOT 42 CENTS OF CONSUMER'S FOOD DOLLAR

The farmer's share of the consumer's dollar spent for 58 foods averaged 42 cents in 1940, compared with 41 cents in 1939, and with 40 cents in 1938, the Bureau of Agricultural Economics reports. The difference or margin of 58 cents represents total charges for all marketing services required to transfer these foods from farmers to consumers--including services of primary marketing, transportation, storage, processing, and wholesale and retail distribution. The changes in these total marketing charges reflect the combined effects of two distinct influences--first, changes in the nature and quantity of marketing services rendered, and second, changes in costs and charges for identical services.

As might be expected, a wide variation in the share for different foods is apparent. The farmer receives large shares for dairy and poultry products and for meat, but receives small shares for canned fruits and vegetables and some highly processed bakery and cereal products.

Discussing long-time trends, the Bureau says that in 1913--the year prior to the World War--the farmer's share averaged 53 cents. Little variation was shown during the next three years, but in 1917 the farmer's share averaged 60 cents. The farmer got only 44 cents in 1921, and in 1929 he received 47 cents. By 1932 the farmer's share had dropped to 33 cents. The largest average in recent years was the 45 cents received in 1937.

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SECRETARY'S 1940 REPORT OUTLINES AGRICULTURE'S PLACE IN DEFENSE

Though the war has accentuated the long-time decline in our farm export trade, the 1940 report of the Secretary of Agriculture shows how agriculture in the United States is putting its full weight behind the defense program. Through Federal, State, and local cooperation, the report says, agriculture is maintaining its output for all requirements, adjusting its crops to changing demands, conserving soil, and mobilizing human and material resources for the general welfare.

The report covers approximately the last 12 months in which Henry A. Wallace held the office of Secretary of Agriculture, and carries an introductory note by Claude R. Wickard, the present Secretary. It gives Mr. Wallace's views of the war's effect on agriculture; of the farmers' altered readjustment problem; of the agricultural aspects of Western Hemisphere cooperation; and of broad agricultural policies such as the conservation program, the land use reorganization effort, the farm security program, and the role of science and technology.

FARM-MORTGAGE DEBT AT
LOWEST LEVEL IN 22 YEARS

The amount of debt secured by liens on farm real estate in the United States on January 1, 1940, is estimated at \$6,910,000,000, the smallest amount outstanding at any time since 1919. This figure is \$161,000,000, or 2.3 percent, below the January 1, 1939 estimate of \$7,071,000,000, and is about 64 percent of the peak amount of \$10,786,000,000 outstanding on January 1, 1923.

The most marked declines in farm-mortgage debt during 1939 were noted in the West North Central States, particularly North Dakota, South Dakota, and Nebraska, in each of which the percentage decrease was in excess of 5 percent, as compared with 2.3 percent for the United States. Increases in debt were most evident in the New England and East South Central regions. Mississippi showed the greatest increase, exceeding 7 percent.

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ONION STOCKS ON JANUARY 1
SMALLER THAN YEAR EARLIER

Onion stocks in the hands of growers and dealers on January 1, 1941, are estimated by the Agricultural Marketing Service to have been 4 percent smaller than stocks on hand January 1, 1940. This estimate is based upon reports from crop correspondents, field investigations, and on available check data. A total of 3,937,000 sacks (100 lbs. each) is indicated to have been on hand January 1, 1941, compared with 4,120,000 sacks a year earlier, and the 10-year (1930-39) average of 3,179,000 sacks.

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REPORT LISTS DISCOVERIES
BY CHEMISTS AND ENGINEERS

New things of wide variety are included in the list of 1940 accomplishments of the Bureau of Agricultural Chemistry and Engineering as detailed in its Annual Report to the Secretary of Agriculture by Dr. Henry G. Knight, Chief of the Bureau. Findings ranged from ways of controlling off-flavor in frozen asparagus to changes in silo construction made necessary by the new practice of putting in green grass for cow feed.

The report called attention to progress made in building and equipping the four new Regional Laboratories for Research on Industrial Utilization of Farm Commodities, some of which already house a part of their scientific staffs. The eastern laboratory is at Wyndmoor, Pa., the northern at Peoria, Ill., the southern at New Orleans, and the western at Albany, Calif.

SAFE-DEPOSIT BOXES FOR FARM PRODUCTS

. By S. T. Warrington

An ordinary safe-deposit box is likely to contain anything from insurance policies on the old homestead to Aunt Nellie's gold watch. But a different kind of box, kept in a room with a temperature near zero, is almost sure to contain frozen food products that have been grown at home or purchased at wholesale. It is estimated that there are more than a million of these lockers--commonly called frozen food lockers--now available to homemakers in over 3,200 plants.

The frozen food locker industry has made most of its growth in the last 10 years, but the movement actually started in Nebraska about 25 years ago. Following the World War, numerous creameries and ice plants in the Pacific Northwest installed lockers in low-temperature rooms for the use of their patrons. Yet it is doubtful if more than 50 plants in the United States provided such service prior to 1930, and these were confined to the Pacific Northwest and the western part of the Corn Belt.

Frozen food lockers became generally popular after 1930 when plants offering chilling, sharp freezing, and other processing services were introduced. Farm families and residents of small towns and villages who had been canning foods readily accepted this means of improving the year-round variety and palatability of foods for table use, especially where such foods were locally produced. Further, many who had been buying such foods at retail found that the savings effected through the use of locker plants were not always as large as represented by some promoters, but they did exist.

Lockers Hit the Million Mark

By January 1, 1940, an estimated 2,500 frozen food locker plants, representing an investment of more than \$25,000,000 were operating in the United States. Leading in the number of plants operated were Iowa, Washington, Minnesota, and Wisconsin, with considerable expansion taking place in the South, especially in Tennessee, Alabama, Mississippi, and Texas.

The estimated 3,200 locker plants in operation today probably represent a total investment of \$32,000,000. With available capacity estimated at 1,000,000 individual lockers--an increase of 200,000 over the preceding year--the demand for this new type of storage has apparently maintained its upward trend.

Plants are owned by private individuals, partnerships, cooperative associations, and corporations. They are operated in connection with retail meat and grocery stores, ice plants, cheese factories, creameries, cotton gins, and farm supply stores, and as separate enterprises.

The modern complete-service locker plants are, in a number of ways, like small meat packing plants. The services provided include either butchering on the farm or at the plant, chilling, cutting, wrapping, grinding, sharp freezing, curing, smoking, lard rendering, and cold storage of meat as well as the freezing and storing of fruits and vegetables.

The up-to-date complete-service establishment consists of four or five main rooms--one for each separate service. In the chill room, meat is thoroughly cooled. Beef and lamb is then pushed into another room where it is aged. Then the carcasses are transferred to the processing room where they are cut into roasts, chops, steaks, hams, and bacons by a trained meat cutter. After cutting and wrapping, the separate cuts are frozen in temperatures ranging from zero to 20 degrees below. The individual lockers are in a separate room that is usually kept from zero to 10 degrees above. Each patron has a key to his own locker and the plant manager has a master key to all lockers.

Fruits and Vegetables Stored

While meats are most commonly stored in frozen food lockers, perishable fruits and vegetables offer real possibilities. The most popular for cold-storage lockers include berries, cherries, grapes, peaches, asparagus, beans, corn, peas, and spinach. Not all vegetables will freeze satisfactorily, however, especially lettuce and tomatoes.

Frozen fruits keep better if they are packed in a heavy sirup. Some fruits are packed in sugar but this method is generally unsatisfactory unless the fruits are to be cooked. The storage temperature for vegetables must not be higher than 10 degrees above zero, and preferably at zero, experiments showing that bacteria and molds are likely to develop at higher temperatures. Vegetables, as a general rule, must not be stored over 3 to 4 months in the ordinary locker-room temperatures. If fruits are packed in a heavy sirup they can be stored for longer periods.

Fresh pork is more susceptible to spoilage than other meats and storage for periods of longer than 3 to 4 months is not recommended unless the temperature is kept near zero. After that time pork may become rancid. A good grade of beef can be held 6 months or longer but poorer grades tend to dry out if they are held too long. Good grade fat lamb cuts may be stored up to 6 months. Ground meat and sausage do not keep as well as unground cuts, and the practice of seasoning sausage before storing impairs its keeping qualities. Poultry can be stored for 6 months or longer, though shorter periods are recommended.

Lockers are usually arranged in five tiers, although some plants may have six. The most common locker rental for bottom drawers is \$12 a year, while the upper lockers generally rent for \$10. In most modern

plants, lockers in the two lower rows are of the drawer type and are more convenient than the door type commonly used in the upper rows. This is the reason for the difference in charges.

Charges for miscellaneous services provided to patrons vary among plants, but the following are fairly representative: For cutting, grinding, wrapping, and freezing, 1-1/4 to 1-1/2 cents a pound; curing and smoking, from 3 to 5 cents a pound; and lard rendering, from 2 to 3 cents a pound. The usual charge for slaughtering hogs of average weight on the farm is \$1 to \$1.50 a head, although it sometimes runs as high as \$2.50. Mileage to and from the farm is frequently added to these rates, and charges for the heavier animals are higher; but many plants are adding facilities for slaughtering at or near the plant.

Savings May Vary

The possibility of effecting savings over purchase at retail when home-produced animals are slaughtered, processed, and stored at the usual rates varies from year to year as well as from one area to another. It is estimated that on beef, savings may amount to 8 or 9 cents a pound; whereas in the case of pork, if the locker plant cures, smokes, and renders the usual proportion of the carcass, the savings will amount to 5 cents per pound.

When comparing this system of processing to farm canning and curing, the advantages are in the elimination of spoilage, and improvement in palatability and variety rather than in cash savings. Hence, annual savings per family will depend on the extent to which they formerly purchased foods at retail.

In the case of fruits and vegetables, lockers offer the average farm family, which has been canning most of these products, little savings as such. However, when such products are properly processed and stored, they provide a much more palatable and, in the case of vegetables, more nutritious food supply than the canned. No doubt, many farm families will purchase through the locker plant operator at wholesale some fruits and vegetables that are not grown locally. In other words, lockers may expand the market for certain types of commercial products and stimulate the production of others.

A recent survey of the locker industry by the Farm Credit Administration indicates that 75 percent of the more than 500,000 lockers in use on January 1, 1940, were rented by farmers. This would indicate that locker storage and the related services are filling a real need in farm families. The 125,000 town patrons who were renting lockers on the same date also must have found much that was to their liking in this type of food preservation, though the advantages to town patrons are not so clear cut. In any event, this industry seems to have a permanent place in rural communities and further growth is sure to come.

On the other hand, there is some question as to whether or not the low-income groups can afford or will use these improvements in food preservation. Whether or not they do will depend to a large extent upon their understanding of its possibilities and limitations, the cost of the service, and the type of service rendered.

The mushroom-like growth of the industry has resulted in unsound and uneconomic developments in some areas. If the service is going to be used extensively, costs will have to be kept in line with benefits derived. There are many advantages to be gained from advanced planning and group discussion of what type of locker plant system will serve the needs of the farming community in the most economical manner. This development may do much to improve the diet of farm families. Further, if properly organized, the locker system may, directly or indirectly, effect profound changes in the entire system of food marketing, processing, and distribution.

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FARMERS' COOPERATIVES NOW FACE PERIOD OF ADJUSTMENT

"Farmers' cooperative marketing associations are facing a period of adjustment that is quite likely to call for a broadening of activities beyond merely merchandising farm products for the best possible price." This statement was made recently by Governor A. G. Black of the Farm Credit Administration before the presidents and secretaries of the 12 regional banks for cooperatives meeting at Washington, D. C.

Black pointed out that many cooperatives were organized for the principal purpose of increasing the price of members' products, but that conditions have changed materially since these organizations first started in business. Competition has become keener and cooperatives that are on their toes in trying to keep in step with the modern trend of business are finding it necessary to spread their activities beyond those of just selling for the purpose of getting a higher price.

"In the future," continued Governor Black, "we will probably see cooperatives include in their activities functions such as assembly, transportation, storage, warehousing, and processing of farm products. The cooperative that takes on new services may not make a profit on all of them, but it may find that it will have a net profit as a result of its combined activities. On the other hand, if it continues on a single-track endeavor it may find itself out of business before long."

Governor Black said that the cooperatives are finding it necessary to consider their positions in terms of what the Federal Government is doing to influence the price of farm commodities. Many cooperatives are beginning to ask themselves whether they are really performing an economic and therefore a necessary function.

THE HONEY SITUATION DURING THE WORLD WAR PERIOD AND NOW

. By Harold J. Clay

Beekeepers haven't forgotten the high prices they received for honey back in World War days--a period when wholesale honey prices occasionally reached 25 cents a pound. Now that the tramp of soldiers' feet is again echoing throughout the land, beekeepers are wondering if higher prices in 1941 aren't more than a mere possibility. Such optimism is only natural, though there is nothing in the present pattern of current developments to indicate that prices will equal the level of the 1917-20 period.

In the first place, one of the principal factors causing honey prices to soar during the war years was an acute shortage of all sweetening agents. Confectioners, bakers, and ice cream manufacturers, unable to obtain sugar, began to use honey as a substitute. In Chicago, wholesale prices of Light Amber extracted increased from 12 cents a pound in June 1917 to 20 cents a pound or more on several occasions in each of the 3 years following. Honey reached 25 cents a pound wholesale in the fall of 1918, and in many other consuming centers the market price went still higher.

Contrast the sugar shortage of World War days with the present situation. Sugar supplies are more than ample. The carry-over of Cuban stocks on January 1, 1941, totaled 1,342,000 short tons, or more than twice the normal carry-over of the previous year. In fact, so much sugar is available in Cuba that present plans for the coming season contemplate cutting production about a million tons. Cuba and other sugar-producing countries are also geared to produce a much greater supply of sugar than at the time of the World War.

Supply and Demand Control Honey Prices

The World War period proves that honey prices will rise if an acute shortage of sugar develops. But, contrary to the belief of many beekeepers, honey prices normally are little affected by prices of sugar. In general, honey prices tend to parallel price trends of food products as a group rather than the trend of any one commodity.

This lack of direct relationship between price trends of sugar and honey was demonstrated in the fall of 1939. Active buying by countless homemakers, who remembered war prices and the scarcity of sugar 20 years earlier, caused the price of wholesale raw sugar to shoot up 30 percent in a few days. Yet, during that time, honey prices did not move upward more than a small fraction of a cent a pound anywhere. In Chicago and in some other cities, the market was actually weaker because many homemakers considered honey a luxury and passed it up in favor of what they considered food necessities.

Foreign countries--whether beekeepers will agree or not--have also classed honey as a luxury and the way things are shaping up now practically no American honey will move out of the country in 1941. This is also in marked contrast to the situation during the World War, when considerable quantities were exported. In 1918, over 12 million pounds of honey were exported to Great Britain alone.

During the first 11 months of 1940, over two-and-a-third million pounds of honey were exported to Canada, or more than went out of the United States to all countries during the comparable 1939 period. Partly as a result of the short honey crop in Canada and the heavy shipments from that country to Great Britain in 1940, prices were higher in Canada than in the United States, even allowing for the customs duty of $1\frac{1}{2}$ cents a pound on honey entering Canada from the United States, plus the 11 percent tax on the difference in exchange rates, plus the Canadian war revenue tax of 10 percent.

It seemed likely that exports to Canada to supply the shortage of honey in that country would continue and would strengthen the market for honey on this side of the border. Several commercial beekeepers who had shipped their honey to Canada had received a premium of one cent a pound on those shipments above the price that some of their neighbor beekeepers had received for honey sold to American buyers. A cent a pound for a 40,000 pound carlot of honey means \$400--an item worth considering.

With little warning, the Canadian War Conservation Act was introduced in the Canadian Parliament on December 2 and made effective on the same date. This act included "honey in the comb or otherwise, and imitations thereof" in the list of commodities that were prohibited from entering Canada from "non-sterling" countries. The former substantial shipments of honey to several European countries stopped suddenly last spring, and since April 1940 scarcely a pound of honey from the United States has gone to Europe.

Domestic Demand Improves

This puts consumption of the honey crop squarely up to the United States. Fortunately, the domestic demand situation is more favorable now than in 1919, or even in the prosperous year of 1929. Industrial production is at a new high peak, and in view of additional orders recently placed for defense material, it is likely to move still higher. Consumer incomes are increasing along with the improvement in industrial activity, with the result that consumer demand for agricultural products is expanding. Several farm products are selling at higher prices than a year ago, and farm product prices as a whole are about two-thirds as high as they were in 1929.

So far this season white honey has been moving unusually well, especially in the East, where many beekeepers are practically sold out. Production of the darker grades in the Far West was heavier than usual,

however, and several million pounds of this darker honey, more suitable for bakers' use than as a table honey, are still in beekeepers' hands. All over the country local sales of honey in small containers have kept up this season at a better-than-normal rate. If some means could be devised to shift honey from areas where it is abundant to sections where it is scarce, stocks everywhere would soon be very light.

Even so, there is reason to think that most of the 1940 crop of honey will move into consumption before new-crop honey appears on the market. Whether the price of honey will advance or not is less certain but some slight gain seems probable.

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COTTON BAGGING FOR COTTON BALES

1941 PROGRAM ANNOUNCED BY SMA

The Surplus Marketing Administration recently announced the 1941 cotton bagging for cotton bales program, calling for the manufacture and sale of up to 2 million cotton "patterns," or bale covers, to encourage the use of domestic cotton for this purpose and to provide an additional outlet for a part of the surplus. The 1941 program will operate similarly to the cotton bagging programs conducted by the SMA in 1938-39 and in 1939-40 under which a total of about 2 million patterns were made and sold by participating manufacturers for use as bale covers.

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WHEAT STOCKS ON JANUARY 1

LARGER THAN A YEAR EARLIER

Stocks of wheat in interior mills, elevators, and warehouses on January 1, 1941, are estimated by the Crop Reporting Board at 165,167,000 bushels. These stocks exceed by 39 million bushels or about 31 percent the January 1, 1940, stocks of 125,741,000 bushels. Stocks are especially heavy in both the hard red spring and hard red winter producing States. Stocks in Idaho, Washington, and Oregon are about average.

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FARM PRODUCTS PRICES AND

COSTS EXPECTED TO RISE

Improvement in the domestic demand for farm products is becoming increasingly apparent, the Bureau of Agricultural Economics reported recently. Despite the virtual loss of export markets and a 1940 volume of agricultural production equal to or in excess of that of any previous year, the index of prices received by farmers was 3 points higher in January than a year earlier. Prospective additional increases in consumer income are expected to improve domestic demand still further.

FEDERAL-STATE EGG GRADING SERVICE
IN OHIO REPORTS SUCCESSFUL YEAR

About 1,109 carloads of eggs, or 13,309,050 dozens, were federally graded and sold in Ohio last year, reports Ray C. Wiseman, supervisor of the Federal-State Poultry, and Poultry and Dairy Products Grading Service in Ohio. The quantity of eggs graded is a substantial increase over the previous year, Wiseman points out.

The grading service in Ohio is furnished at cost to any group of producers or to any independent organization seeking to improve its methods of marketing poultry products. The use of the U. S. grades in Ohio during the past eight years has been a great factor in building confidence among producers, handlers, and consumers in a quality production and marketing program.

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SMA ANNOUNCES PROGRAM FOR USE OF
IRISH POTATOES AS LIVESTOCK FEED

A program for the diversion into livestock feed of up to 12,500,000 bushels of 1940 crop Irish potatoes in eight Western States was announced recently by the Surplus Marketing Administration. The program provides for payments to eligible growers of 25 cents per hundredweight, or 15 cents per 60-pound bushel, for potatoes of U.S. No. 2 grade or better and not less than $1\frac{1}{2}$ inches in diameter, which are diverted into livestock feed.

Growers eligible to participate in the program are those in designated commercial potato-producing districts of the eight States and who cooperated in the 1940 Agricultural Adjustment Administration Potato Acreage Allotment Program. Under this program, the cooperating grower received a payment at the rate of 2.7 cents per bushel on the normal yield for keeping his potato acreage within his allotment.

The States and districts in which the SMA Potato Livestock Feed Diversion Program will operate, are: (1) Colorado and heavy production areas in western Nebraska and southeastern Wyoming; (2) heavy producing sections of Idaho and Malheur County, Oregon; (3) Box Elder, Cache, Davis, Millard, Morgan, Piute, Utah, and Weber Counties in Utah; (4) the Klamath section, and Crook, Deschutes, and Klamath Counties in Oregon, and Modoc and Siskiyou Counties in California; and (5) Kittitas, Yakima, and Benton Counties in Washington.

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United States imports of beef cattle in 1940 were down 16 percent, and canned beef imports showed a decline of 29 percent, the Office of Foreign Agricultural Relations said recently.

CCC ANNOUNCES SALES POLICY
ON ITS TERMINAL-STORED CORN

The Commodity Credit Corporation has announced that its corn stored in terminal and subterminal warehouses in the Chicago market will be offered for sale at the prevailing market price, but not less than 69 cents per bushel f.o.b. point of storage for No. 2 Yellow corn. Corn stored in other terminal and subterminal markets will be offered for sale and priced at a fixed relationship to Chicago market values, such relative values to be announced later, but in no case shall the price be less than 65 cents per bushel for No. 2 Yellow corn, plus transit value of freight paid, if any.

All sales will be made by the Commodity Credit Corporation office at 164 West Jackson Boulevard, Chicago, Illinois. State and county AAA committees will supply information and assist in making sales to feeders and other purchasers in their respective areas.

This sales policy covers approximately 59 million bushels of corn stored in terminal warehouses and 16 million bushels of corn stored in subterminal warehouses. The corn is exceptionally high-quality corn of the 1937, 1938, and 1939 crops which has been delivered to the Corporation by farmers in settlement of loans made in connection with the AAA Farm Program.

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SMA OFFICIAL CITES NEED FOR BETTER
GRADING AND PACKING OF VEGETABLES

Failure to market vegetables in a manner attractive to consumers and dealers is the main reason why nearby growers have had to face increased competition from producers in more distant areas, J. P. Hatch of the Surplus Marketing Administration told New Jersey growers recently.

"During the past five years, there has been an increase of nearly two billion pounds, or more than 17 percent, in the total U. S. commercial production of 21 principal truck crops for fresh market," Hatch reported. "In the past season there was an increase of more than 222 million pounds, or about 2 percent. Since this increase has taken place almost entirely in commercial-producing areas far from the principal centers of consumption, it means that gardeners in nearby areas must face increased competition from the better-graded, better-packaged produce that is shipped in from considerable distances."

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The 1940 California peach crop was 18,264,000 bushels larger than that of Georgia--the "Peach State."

-PERTAINING TO MARKETING-

The following publications in the general field of farm-product marketing, issued recently, may be obtained upon request from:

Agricultural Marketing Service:

The Compression of Cotton, and Related Problems . . . By John W. Wright and Charles A. Bennett

The A B C of Canned Fruit and Vegetable Grade Labeling

Handling Rough Rice to Produce High Grades. . . By W. D. Smith

Regulations for Warehousemen Storing Cold-pack Fruit (S.R.A.159)

Market Classes and Grades of Cattle. . . By Don J. Slater

Official Grain Standards of the United States for Oats and Rye
(Title 7, Chapter 1, Part 26, of the Code of Federal Regulations)

Market Summaries:

Motortruck Shipments of Citrus Fruit from the Lower Rio Grande Valley of Texas, 1939-40 Marketing Season. . . Wm. E. Paulson

Brief Review of the Arizona 1940 Fall Lettuce Season

Bureau of Agricultural Economics:

The National Food Situation

Agricultural Finance Review, November 1940

Farm Credit Administration:

Some Facts Concerning Competition Between Apples and Other Fruits at Retail, New York City, August 1939. . . By Marius P. Rasmussen, Ford A. Quitslund, and Edwin W. Cake

Frozen-food Locker Plants in the United States. . . By S. T. Warrington (see page 13)

Office of the Secretary:

Report of the Secretary of Agriculture, 1940 (See page 11)

Agricultural Preparedness (Address). . . By Claude R. Wickard